

REMARKS

The present amendment cancels without prejudice three independent claims and adds two, for a net deletion of one independent claim. The cancellation of claims 86, 87, 90, 93, 97, 110, and 116 and the addition of claims 117 to 150 results in a net addition of 78 claims, for which a fee of \$1716 is due. Permission is given in the accompanying transmittal form to charge deposit account 21-0175 for this fee.

In applicants' last communication (delivered to the USPTO on April 28, 1994), the applicants presented method claims to the use of novel and unobvious unleaded gasoline compositions, the broadest of said compositions being defined in claims 83 and 106, as summarized in the following Table A:

Table A

RVP psi	T ₅₀ °F.	T ₉₀ °F.	Olefin Vol. %	Paraffin Vol. %	Octane	Oxygenate Required?
<7	≤210	<300	<10		≥87	No

After applicants' last communication, a review of the present application led applicants to recognize that they could also have included claims to the use of five additional gasoline compositions disclosed in the specification which were novel and unobvious over the prior art but which were not covered in any of the previously pending method claims 83 to 116. These compositions have properties as identified in the following Table B:

Table B

	RVP psi	T ₅₀ °F.	T ₉₀ °F.	Olefin Vol. %	Paraffin* Vol. %	Octane	Oxygenate Required?
1	<7	≤210			>72	≥87	No
2	<7	≤210			>65	≥92	No
3	<7	<193		<10		≥87	No
4	<7	≤210		<1		≥87	No
5	<7	≤210		<10		≥87	Yes** ≤17.2% MTBE

*Paraffins (i.e., all saturates, as determined by FIA test, per Tables 2 & 5 of specification)
** Total oxygen equal to equivalent of 17.2% volume percent MTBE, max.

The main purpose of the present amendment is to gain protection for the use of the five unleaded gasoline compositions of Table B in methods entirely analogous to one or more of method claims 83 to 116--and specifically, in an automobile engine to lower the amount of pollutants in the exhaust emitted from the catalytic converter (claims 142-150) or in aiding in the reduction of air pollution in a geographical region with significant air pollution (claims 117 - 141). It will be seen that these five novel and unobvious unleaded gasoline compositions are set forth as a 5-membered Markush group (in the same order as listed numerically in Table B) in the two newly added independent claims 117 and 142, which in turn have been drafted to be otherwise similar to pending claims 106 and 83, respectively.

In their Amendment and IDS #3 submitted to the USPTO on April 28, 1994 the applicants advanced their arguments as to the patentability of claims 83 to 116 as directed to novel and unobvious methods--and, in particular, to the novel and unobvious use of unleaded gasoline compositions which themselves were novel and unobvious. The same arguments pertain identically or by close analogy to newly added claims 117 to 150.

In particular, the invention is patentable over all art submitted to the USPTO with applicants' IDS #3. A great amount of information was presented and discussed in this IDS #3, but on inspection, it will be found that very little of it pertains to unleaded gasolines having both an RVP less than 7.0 psi and a T50 no greater than 210° F. Thus, it should take only little time to confirm that these five gasolines are indeed novel and unobvious over the art cited in IDS #3, as will now be shown.

In IDS #3 Sections A, D, and F pertain to gasolines having an RVP less than 7 psi and a T50 no greater than 210° F.

With regard to Section A, an Attachment A was included listing the properties of the most pertinent gasolines discussed in Section A. (A copy of Attachment A is enclosed herewith.) As can quickly be verified, none of the gasolines listed in Attachment A falls within the five compositions of Table B. Likewise, Attachment C (copy enclosed) from Section D of IDS #3, listing the properties of all gasolines on the Niper summer data base from 1976 to 1990 (sans 1987) having an RVP \leq 7 psi and T50 \leq 215° F., evidences no gasoline falling within the scope of the five compositions of Table B.¹ Finally, in Section F of IDS #3, the data relating to the 6/86 Honolulu gasoline (on page 25 of Attachment I), while admittedly falling within the scope of some of the five claimed compositions, cannot be used as prior art since other information presented with IDS #3 (in particular the affidavits of Ms. Minner and Dr. Russell) clearly establishes the error in the reported 6.7 psi RVP value for the 6/86 Honolulu fuel. Accordingly, the applicants submit that all five fuels recited in the two newly added independent claims 117 and 142 are novel and unobvious over the prior art.

Accordingly, although the present amendment introduces method-of-use claims covering five new compositions, **the issues in this case remain substantially unchanged.** Where the applicants had been seeking coverage for methods pertaining to one novel and unobvious gasoline composition, the claims of the application now seek to cover six such compositions. In all other important respects, the arguments made in applicants' AMENDMENT of April 28, 1994 are entirely applicable to the present claims. Hence, the applicants submit that all claims as presently drafted define novel and unobvious subject matter within the meaning of 35 USC 102 and 103.

¹ Indeed, only two compositions listed in Attachment C are unleaded gasolines with an RVP less than 7 psi, and as to those two, there are no data as to (1) olefin content, (2) paraffin content, or (3) oxygenate presence, at least one of which three features is required in each of the five compositions recited in claims 117 and 142.

The Examiner will also note that the compositions recited in the newly added claims are fully supported by the disclosure. In particular, support for limitations found in the newly added claims can be found as follows:

<u>Limitation</u>	<u>Support</u>
RVP less than 7 psi	Page 3, line 31
T50 no greater than 210° F	Page 28, line 17
T50 less than 200° F	Page 28, lines 19 & 20
T50 less than 193° F	Page 28, lines 21 & 22
Octane value of 87+	Page 9, line 8
Octane value of 92+	Page 9, line 8
T90 no greater than 315° F.	Original Claim 18 & 26
T90 less than 300° F.	Original Claim 29
Paraffin content greater than 72%	Page 29, lines 30 & 31
Paraffin content greater than 65%	Page 29, lines 28 & 29
Olefin content less than 10%	Page 28, line 34
Olefin content less than 8%	Page 28, line 34
Olefin content less than 6%	Page 28, line 35
Olefin content less than 1%	Page 28, line 35
Presence of Oxygenate up to 17.2%	Page 8, lines 29 to 33 Page 36, lines 1 to 10 Table 2
10.1 to 17.2% Oxygenate	Page 8, lines 29 to 33 Page 36, lines 1 to 10 Tables 2 and 5
10.1 to 14.9% Oxygenate	Page 8, lines 29 to 33 Page 36, lines 1 to 10 Tables 2 and 5

Finally, a word with regard to amended claims 94, 98, and 99. The limitation for a T10 maximum of 140° F. introduced into claims 94 and 98 is supported in the specification at page 29, line 16. Claim 99 was amended to contain an RVP limitation of "no greater than 6.8 psi," this limitation having been cancelled from claim 98 and supported by the disclosure on page 29, lines 5 to 12.

Having thus shown support for all the composition limitations of claims added or amended by the present amendment, and having limited their claims to novel and unobvious methods of use, the applicants submit that their invention as claimed is patentable. An allowance is requested.

Respectfully submitted,



Gregory F. Wirzbicki
Attorney for Applicants
Registration No. 27,606

July 27, 1994

Union Oil Company of California
P. O. Box 7600
Brea, CA 92622-7600

```

22      if t50 ne . ;
23      if mtbe ne . ;
24      if mtbe lt 50;
25      if paraf gt 65;
26 run;

```

NOTE: The infile IN is:
 FILENAME=d:\[REDACTED]\gas.da.
 RECFM=V,LRECL=250

Post-it™ brand fax transmittal memo 7671		* of pages >	1
From:	Greg Wirsicki	To:	Peter J TessVP
Co.		Co.	
Dept.		Phone #	230 9748
Fax #		Fax #	731 3277

NOTE: Invalid data for MTBE in line 45541 213-216.

RULES: 45541 9003 MIAMI MOBIL RU 91.4 82.0 86.7 89.0
 66 88.9 62.9 12.2 2.44 108 113
 131 120 124 131 90 94 111 123 132 148 168 192 218 244 279 328 355
 196 380 95.0 1.0 4.0 <0.0 216

CITY-MIAMI COMPANY-MOBIL GRADE-RU YY-90 MM-3 RON-91.4 MON-82.0 AKI-86.7
 RVP-12.2 AROM-. OLEF-. PARAF-. T50-192 T90-328 MTBE-. _ERROR_-1 _N_-45541

NOTE: 50633 records were read from the infile IN.

The minimum record length was 89.

The maximum record length was 236.

NOTE: The data set WORK.ONE has 0 observations and 15 variables.

NOTE: The DATA statement used 1 minute 21.94 seconds.

```

27
28 proc print;
29   title1 ' [REDACTED] data base subset with';
30   title2 'RVP <= 7.5';
31   title3 'olefins < 10';
32   title4 'T50 <= 215';
33   title5 'T90 <= 315';
34   title6 'paraffins > 65';
35   title7 'prior to 1991';
36   title8 'd:\[REDACTED].output';
37 run;

```

NOTE: No observations in data set WORK.ONE.

NOTE: The PROCEDURE PRINT used 0.59 seconds.

RVP = 7.5 psi Paraffins > 65
 Olefin < 10
 T50 <= 215
 T90 <= 315



8 7147313277

CIS PRODUCTS

POG

Niper Gasoline Survey Summer 1976 - 1990
except 1987 16:07 Friday, September 2, 1994
RVP <= 7.5 psi, T50 <= 215 F, and T90 <= 315 F

OBS	Rvp (psi)	T50 (F)	T90 (F)	MeOH	EtOH	tBuOH	Other O	TEL	R+M/2	DATE
1	0.0	.	.	.	.	.	.	0.26	89.20	7/86
2	4.5	.	.	.	.	.	.	.	88.05	6/86
3	6.3	203	305	.	.	.	.	3.34	86.50	8/76
4	6.4	205	306	.	.	.	.	0.01	85.80	8/81
5	6.5	202	307	.	.	.	.	.	87.10	8/76
6	7.0	201	299	.	.	.	.	0.01	90.90	6/76
7	7.1	208	309	.	.	.	.	2.24	91.90	8/80
8	7.2	.	.	.	.	.	.	.	87.30	8/90
9	7.2	210	300	.	.	.	.	.	87.60	8/76
10	7.2	214	314	.	.	.	.	.	87.35	6/80
11	7.3	185	305	.	.	.	.	.	94.30	6/78
12	7.3	203	314	.	.	.	.	1.40	94.90	5/79
13	7.3	207	309	.	.	.	.	.	90.65	6/78
14	7.3	210	308	.	.	.	.	.	93.85	8/77
15	7.4	205	303	.	.	.	.	0.03	90.35	6/78
16	7.4	210	302	.	.	.	.	2.60	94.80	8/76
17	7.4	210	305	.	.	.	.	0.05	90.35	6/78
18	7.4	213	302	.	.	.	.	3.24	95.65	8/76

LAR Unleaded Plus 87 - Blend Sheet Data (NOT INCLUDING H-O GRADE)

DATE	BARREL	DEG. API	RVP	VL	BROMIN	SULFUR	MERCAP	MON	R+M2	10% PT	50% PT	90% PT	WUN
MAY 10	1989	83.7	55.5	8.1	2	3	36	0.3	83.2	87.3	127	231	352
JUN. 21	1989	81.0	59.2	8.1	18	16	14	0.2	83.3	87.3	128	202	351
AUG. 26	1988	79.0	57.2	8.1	18	18	273	1.3	82.8	87.4	125	200	350
AUG. 30	1988	79.0	59.1	8.1	17	10	228	1.1	82.8	87.4	126	204	328
JUL 24	1989	68.8	55.0	8.0	19	19	0.9	0.9	82.8	87.2	128	202	317
OCT. 26	1989	63.6	62.4	8.0	7	18	136	0.6	83.4	87.2	128	203	326
MAY 15	1989	81.4	63.1	8.0	17	18	169	1.2	83.5	87.4	130	198	335
MAR. 24	1989	64.3	56.8	8.0	2	21	19	0.9	83.1	87.3	130	192	304
AUG. 24	1988	79.0	61.2	8.0	21	16	213	0.9	87.3	121	188	320	357
AUG. 18	1988	84.0	59.3	8.0	10	2	19	1.0	84.2	87.3	128	195	326
FEB. 2	1989	81.4	63.6	7.9	1	13	159	1.0	83.6	87.4	134	199	366
MAY 29	1989	83.7	55.8	7.9	1	13	116	0.6	82.8	87.3	127	203	328
AUG. 9	1989	71.8	61.0	7.9	7	10	19	0.5	83.7	87.2	128	188	375
FEB. 22	1989	84.0	55.5	7.9	13	13	213	1.5	82.8	87.4	130	198	374
JUL 30	1988	83.9	57.0	7.9	13	13	213	1.5	82.8	87.4	130	192	357
JUN. 13	1987	58.9	58.6	7.9	21	18	210	1.8	82.2	87.0	115	185	335
FEB. 10	1987	73.9	55.2	7.9	3	25	19	3.4	83.0	87.0	122	205	364
FEB. 7	1987	68.9	58.3	7.9	2	12	19	3.4	83.0	87.0	122	205	367
FEB. 4	1989	81.9	59.7	7.8	3	12	152	5.0	82.5	87.0	125	209	310
AUG. 18	1989	73.9	58.7	7.8	3	18	213	1.5	82.8	87.4	130	204	352
OCT. 1	1989	59.1	54.7	7.8	6	26	210	1.8	82.2	87.0	115	185	335
OCT. 6	1989	79.7	59.0	7.8	1	14	19	3.4	83.0	87.0	122	205	364
AUG. 31	1989	81.9	57.3	7.8	1	11	19	3.4	83.0	87.0	122	205	367
JUN. 26	1989	71.7	57.9	7.8	6	25	19	3.4	83.0	87.0	122	205	367
FEB. 17	1988	78.9	56.7	7.7	1	21	177	0.8	82.9	87.3	128	203	334
FEB. 13	1988	82.0	56.7	7.6	0	22	247	0.3	83.4	87.2	129	212	345
AUG. 20	1989	80.9	56.1	7.6	1	20	257	1.1	83.9	87.2	123	198	320
JUL 1	1988	81.4	59.1	7.4	12	22	257	0.2	83.4	87.2	131	215	338
AUG. 2	1988	56.0	56.7	7.4	1	20	257	1.4	82.8	87.4	131	215	338
SEPT. 30	1989	58.3	58.6	7.3	23	197	2.0	2.0	82.6	87.0	125	194	329
AUG. 15	1989	83.6	54.2	7.2	19	19	207	2.0	82.6	87.2	125	194	329
		56.1	7.1	10	6	11	19	1.1	83.8	87.2	134	209	320
		109	19	19	8	11	19	1.1	83.0	87.0	128	200	309
		109	19	19	6	11	19	1.1	84.0	87.3	125	194	329
		109	19	19	6	11	19	1.0	82.8	87.2	132	213	340
		109	19	19	6	11	19	1.0	82.8	87.2	132	213	340
		109	19	19	6	11	19	1.0	82.8	87.2	132	213	340

LOS ANGELES REFINERY Products Report

PAGE 2

UNLADED REGULAR GASOLINE (87 OCTANE) (C AND N/H GRADES)									
TANK NUMBER	186	195	203	212	219	234	245	248	254
SAMPLE NUMBER	9528	9526	PS28	4525	5529	4526	9529	8206	5526
DATE BLEND COMPLETED	06-02-85	06-10-85	06-16-85	06-21-85	07-01-85	07-07-85	07-13-85	07-21-85	07-27-85
BARRELS BLENDDED	56.8	39.4	46.0	39.6	39.7	79.0	79.6	79.0	79.0
GRADE	N-H	H-H	H-H	N-H	N-H	N-H	N-H	C	N-H
UNIFINED CS/C6	18.97	30.87	27.76	27.83	36.67	35.57	15.72	10.17	12.93
UNISOL LT CAT GASO	13.82	21.88							
U33 AVIA BASE STOCK									
U80 REFORMATE									
U110 LITE ALKY									
BLENDING BUTANE	0.65	3.45	5.58	23.16	11.19	13.56	21.72	15.35	
U120 LT UNICRACKATE	0.09	0.21	1.11	1.37	0.26	0.41	1.16	2.19	0.18
U60 REFORMATE	0.35	1.38	5.62	20.77	15.64	—	26.70	25.20	29.62
U60 UNIF MVY CAT GASO	9.71	16.15	22.66	35.51	8.14	32.55	11.20	23.16	
MOTOR ALKY	2.59	1.63	1.63	2.37	3.37	3.39	2.92	1.08	
U100 REFORMATE	11.06								
OFFSHORE GASO									
INTERFACE									
GRAVITY API 60 F.	28.19	4.84	22.44	26.29	7.65	3.42	2.99	1.60	1.60
APPEARANCE									
CORROSION 3 HOURS 122 F.	58.3	55.8	55.6	55.28	56.0	56.5	60.6	57.6	
VAPOR PRESS REID	C/B	C/B	C/B	C/B	C/B	C/B	C/B	C/B	
30 DAY AVERAGE	1A	1A	1A	1A	1A	1A	1A	1A	
V/L RATIO	90MX83	70MX83	90MX86	90MX83	90MX82	90MX83	115MX85	90MX85	
30 DAY AVERAGE	90MX84	70MX84	90MX86	90MX83	90MX81	90MX82	115MX86	90MX85	
GUNS EXISTENT MG/100 ML	140T21	140T19	140T16	140T23	140T8	140T16	140T18	127T8	140T21
ISO RATING	4.0	4.0	0.5	0.5	1.7	1.7	1.7	1.7	1.7
OBDURATION STAR MINUTES	100 MAX	39	1640	1020	900	1950	1460	810	735
30 DAYING NUMBER 6/100G	28 MAX	10	19	19	2	7	1	9	9
SULFUR PPM	300 MAX	20	225	232	65	92	23	101	105
MERCAPTAN SULFUR PPM	5.0 MAX								
30 DAY AVERAGE	2.6		2.6	1.2	1.5	1.1	1.0	3.9	1.2
LEAD, GM/GAL	6.0 MAX		1.7	1.8	1.7	1.9	1.4	1.1	1.2
LEAD, GR/GAL (TANK)	0.02 MAX		0.007	<0.005	<0.005	<0.005	<0.005	1.0	1.2
OTDR OCTANE	82.0 MIN		<0.005	<0.005	<0.005	<0.005	<0.005		
30 DAY AVERAGE	82.71	92.62	92.52	82.61	33.36	83.04	52.65	52.76	82.57
RESULT	82.71	92.64	92.63	82.74	22.74	92.79	82.97	82.49	82.57
OCTANE NO (R+M)/2	87.0 MIN	87.03	87.61	97.02	37.03	57.05	87.03	87.01	87.05
30 DAY AVERAGE	87.15	87.23	87.19	87.19	57.10	57.03	87.03	87.02	87.35
EP DEGREES F	432 MAX	426	616	429	405	391	425	429	414
RECOVERY VOL PCT	95.0 MIN	30	99.0	95.5	97.0	97.0	99.0	97.0	96.0
RESIDUE VOL PCT	2.0 MAX	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SP 30 DAY AVERAGE	433 MAX	413	413	416	621	607	409	414	410
102 EVAP DEGREES F									
SUS EVAP DEGREES F	170 MIN SPEC MAX	253MX200	233MX190	253MX215	252MX196	253MX200	253MX199	253MX212	243MX170
QCZ EVAP DEGREES F									
WARM UP NUMBER									
30 DAY AVERAGE									
1.0 APPLIES TO "4 GRADE ONLY									
2.0 C GRADE MAX IS 1000 PPM									
3.0 DOES NOT APPLY TO C GRADE									

```

1  * d:\niper\lit75uc.sas
2  * This program reads in the literature fuels and searches for any
3  * fuels that have RVP < 7.5 psi, T50 <= 215F, T90 <= 315F,
4  * paraffins > 65%, olefins < 10%, R+M/2 >= 8%, and are unleaded
5  * and contain oxygenate
6 ;
7
8 options pagesize =43 linesize =80;
9
10 data one;
11   infile 'd:\niper\lit75uc.dat' missover;
12   input public $ 1-13 page $ 14-18 table $ 19-25 fuel $ 27-35
13     rvp 36-38 t50 40-42 t90 44-46 olef 48-51 arom 53-56
14     sats 58-61 lead $ 62-63 ron 64-68 mon 70-73 mtbe 75-78
15     etoh 79-82 etbe 84-87 ipa 89-92 tba 93-97
16     comments $ 99-121 rm2 122-127 owt 128-132 ;
17     r = (ron + mon)/2;
18     if r = . then r = rm2;
19     rm = round(r,.1);
20     mtbe = round(mtbe,.1);
21     etoh = round(etoh,.1);
22     etbe = round(etbe,.1);
23     ipa = round(ipa,.1);
24     tba = round(tba,.1);
25     length calc $ 1;
26     if sats = . and arom ne . then do;
27       sats = 100 - arom - olef;
28       calc = '**';
29     end;
30     tot = arom + olef + sats;
31     total = round(tot,1);
32     /*if lead = '?' then lead = 'P';
33     /*if rvp < 7.5;
34     if rvp ne .;
35     format rm 5.1 ;
36     /*if olef < 10;
37     /*if sats > 65;
38     /*if T90 <=315;
39     /*if T50 <=215;
40     /*if rm >= 87;
41     /*if mtbe ne . or
42     etbe ne . or
43     etoh ne . or
44     ipa ne . or
45     tba ne . ;
46 title1 "Fuels Survey";
47 title2 "Publications Pre '91 in SN 08/077,243 f. 6/14/93 Jessup et
al.";
48 title3 'RVP <= 7.5, T50 <= 215F, T90 <=315F, and Grade = Unleaded';
49 title4 '>= 87 Octane, <10% Olefins, >65% Paraffins, Oxygenated';
50
51   label rm = 'R+M/2'
52     rvp = 'Rvp*(psi)'
53     T50 = 'T50*(F)'
54     T90 = 'T90*(F)'
55     arom = '%*AROM-*atics'
56     olef = '%*Ole-*fins'

```

```

57      sats = 't*Satu-*rates'
58      total = 'T*(2)'
59      public = 'Article*(4)'
60      lead = 'NB*(3)'
61      page = 'Pg*(5)'
62      table = 'Table*(5)'
63      fuel = 'Fuel'
64      calc = 'C*(1)'
65      mtbe = 'MTBE*(t)'
66      etoh = 'EtOH*(t)'
67      atbe = 'ETBE*(t)'
68      ipa = 'IPA*(t)'
69      tba = 'TBA*(t)'
70      comments = 'Comments'
71      ;
72
73
74  proc sort;

```

NOTE: The infile 'd:\niper\lit75uc.dat' is file D:\NIPER\LIT75UC.DAT.
 NOTE: 293 records were read from the infile D:\NIPER\LIT75UC.DAT.

The minimum record length was 129.
 The maximum record length was 129.
 NOTE: Missing values were generated as a result of performing an operation on missing values.

Each place is given by: (Number of times) at (Line):(Column).

```

268 at 20:27
283 at 21:27
291 at 22:27
291 at 23:26
291 at 24:26
134 at 17:14
49 at 19:22
210 at 30:18
105 at 31:27
27 at 27:17

```

NOTE: The data set WORK.ONE has 0 observations and 26 variables.

NOTE: The DATA statement used 9.00 seconds.

```

75      by rvp descending T50 descending T90;
76      proc print label split = '*' r uniform;

```

NOTE: The data set WORK.ONE has 0 observations and 26 variables.

NOTE: The PROCEDURE SORT used 1.00 seconds.

```

77      var rvp t50 t90 olef arom sats calc total
78          mtbe etoh etbe ipa tba rm lead public page table fuel comments;
79
80      run;

```

WARNING: No observations in data set WORK.ONE.

NOTE: The PROCEDURE PRINT used 0.00 seconds.